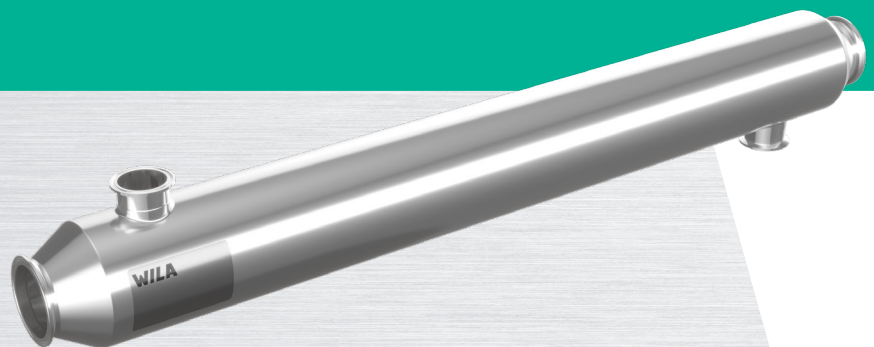


TUBULAR LIQUID COOLER

DETAILED OVERVIEW FOR TYPE 'TLC'
HIGH PRESSURE - 60 BAR

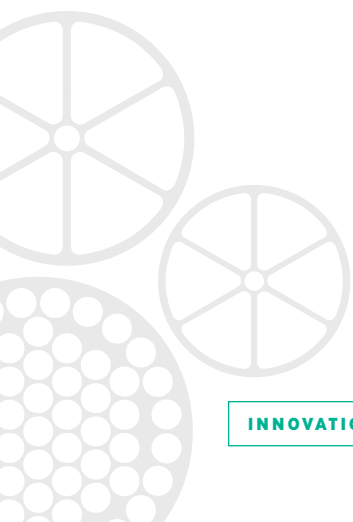


Dimensions overview for type Ø133 - 60bar[g]

Tubular Liquid coolers are highly used in the food and beverage industry and in connection with many applications such as CIP units. In the food and beverage industry tubular heat exchangers are often used in systems to reduce or eliminate microbials to make products safe for consumption and to extend their shelf life. A tubular heat exchanger may also be used to heat or cool products prior to filling, drying, concentration or other processes.

Content

Introduction	3
Regulations and Directives	3
Documentation	3
Group specifications.....	4
Connections	5
Shell side workflow	5
TLC-.5-133-60	6
TLC-0 -133-60	7
TLC-02-133-60	8
TLC-03-133-60	9



Introduction

This overview is for Tubular Liquid Coolers manufactured by Wila A/S under the category "TLC" hereinafter referred to as "Heat Exchanger". A Tubular Heat Exchanger is by design, two Pressure chambers in a combined housing.

The inner chamber consists of both ends and the insides of all tubes in the tube bundle, hereinafter referred to as "Tube side" or "Product side".

The outer pressure chamber consists of the outside of the tube bundle, and the inside of the exchangers outer shell, hereinafter referred to as "Shell side" or "Service side".

The Heat Exchanger is intended for a fluid to fluid heat transfer, **either** cooling or heating and is made from EN.1.4404 (AISI 316L) stainless steel with a sanitary surface finish. The tube side is suitable for food stuff fluids, such as dairy products and juices. The entire inside surface roughness is $\leq 0.8 \mu\text{m}$ and the outside surface roughness is $\leq 1.6 \mu\text{m}$. **All fluid media in use with the Heat exchanger, must be compatible with EN.1.4404 (AISI 316L) Stainless Steel.**

The 60 BAR (870 PSI), maximum product side pressure, heat exchanger design is based on a $\varnothing 133 \times 4$ shell. Other sizes and pressure ratings are also available.

Regulations and Directives

The heat exchanger is designed and manufactured in accordance with

- the European Commission regulation No. 2023/2006 (Good Manufacturing Practices)
- the European Parliament directive No. EN 1935/2004 (Food Contact Materials).
- the European Parliament directive No. EN 1907/2006 (Chemical Restrictions (REACH)).
- PED - Article 4.3 (SEP) in the European Parliament directive No. 2014/68/EU (Pressure Equipment Directive). The Heat Exchanger is only designed for fluid group 2 (non-dangerous fluids).

Documentation

1. Customer drawing with description and design data table
2. Declaration of conformity
3. Pressure test certificate
4. User Manual

As Supplement the following can be provided:

5. 3.1 material certificates according to EN 10204
6. Weld-logs with associated welding certificates according to DS/EN ISO 9601-1.

Group specifications

Group ordering codes and specifications are as listed below. A more detailed group tables with unit codes and main dimensions can be found on the following pages.

TLC-xx-133-60

TLC	Tubular Liquid Coolers.	
xx	.5, 01, 02, 03	Indicates the heat transfer surface area in m ² .
133	Ø133	Indicates the heat exchanger shell diameter in mm.
60	The heat exchanger is designed for pressures up to 60 bar	

TLC-xx-xxx-yyy-zz

xx	See above	
xxx	See above	
yyy	See below	Indicates tube side clamp ferrule connection.
zz	See below	Indicates shell side clamp ferrule connection.

Tube side (P1 and P2) connections are:

Shell size's	Tube side connection size's	
Ø133	DN100-DN80-DN65	in accordance with DIN 32676-A
Ø133	4" (Ø101.6) - 3" (Ø76.1) - 2.5" (Ø63.5)	In accordance with ISO 2852-2

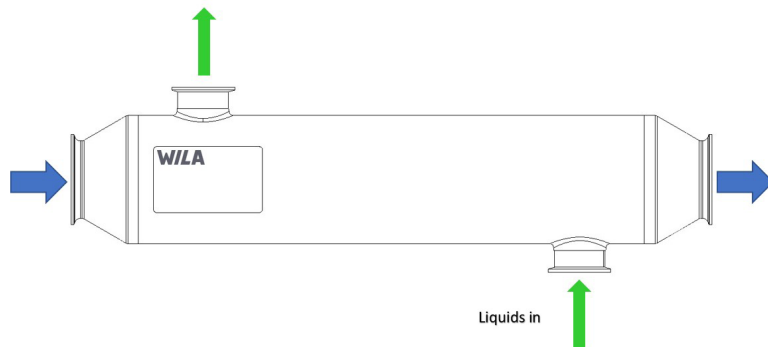
Shell side (S1 and S2) connections:

DN20 - DN25 - DN40 - DN50 - DN65	in accordance with DIN 32676-A
3/4" (Ø20) - 1" (Ø25) - 1.5" (Ø38) - 2" (Ø51) - 2.5" (Ø63.5)	in accordance with ISO 2852-2

For both tube and shell sides other connection types and sizes are available.

Connections

Always follow your fitting supplier guidelines and local legislations. Depending on the connection size either SH or SSH clamping rings (or similar) are recommended. For liquids, the outlet should be at the highest point to ensure complete removal of air in the chamber.



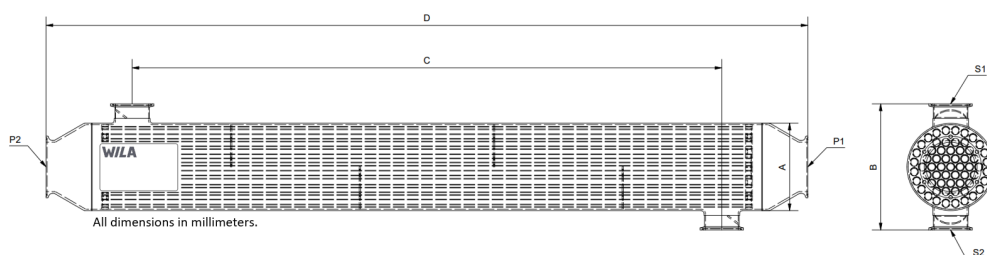
Shell side workflow

The liquid cooler shell side recommended workflow limits are based on the most optimal placement of our baffle plates in the tube bundle, which varies with the size of the liquid cooler:

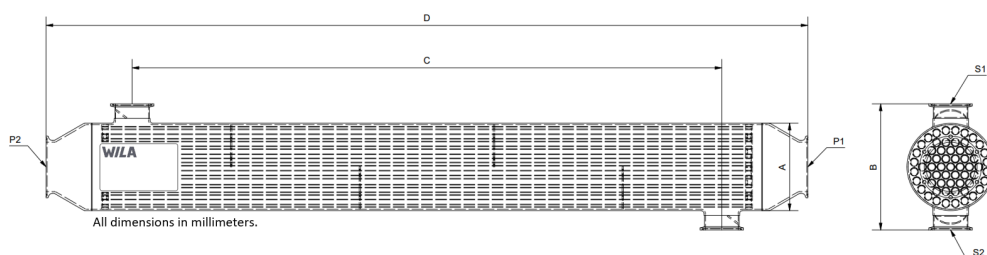
- For liquid cooler size 0.5m² the recommended maximum shell side workflow is 3 m³/h
- For liquid cooler size 1 m² the recommended maximum shell side workflow is 3 m³/h
- For liquid cooler size 2 m² the recommended maximum shell side workflow is 7 m³/h
- For liquid cooler size 3 m² the recommended maximum shell side workflow is 12 m³/h

Note:

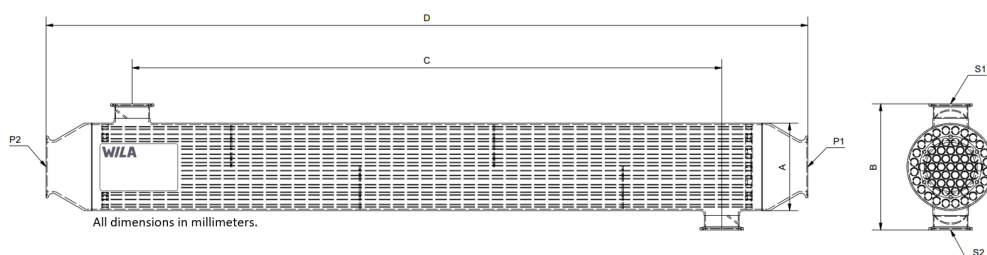
In the following group tables 'Tube bank' is data on the product tubes running parallel inside the shell.



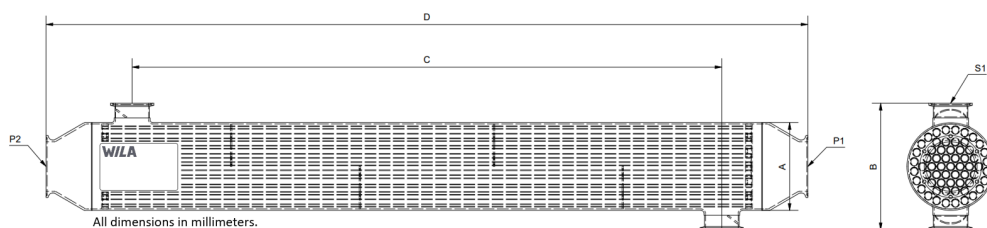
TLC-.5-133-60		60 barg / 85°C		16 bar[g] / 95°C		Maximum pressure / temperature		
		Volume 3 liters		Volume 1 liters		316L Concentric		Dry weight 8 kg
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-.5-133-100-25	W-038241	DN100	Ø133	Ø25	186	160	354	61 pc Ø12x1mm
TLC-.5-133-101-25	W-038242	Ø101.6	Ø133	Ø25	186	160	350	61 pc Ø12x1mm
TLC-.5-133-080-25	W-038243	DN80	Ø133	Ø25	186	160	372	61 pc Ø12x1mm
TLC-.5-133-076-25	W-038244	Ø76.1	Ø133	Ø25	186	160	396	61 pc Ø12x1mm
TLC-.5-133-065-25	W-038245	DN65	Ø133	Ø25	186	160	400	61 pc Ø12x1mm
TLC-.5-133-063-25	W-038246	Ø63.5	Ø133	Ø25	186	160	418	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-.5-133-100-21	W-038247	DN100	Ø133	Ø21.3	179	160	354	61 pc Ø12x1mm
TLC-.5-133-101-21	W-038248	Ø101.6	Ø133	Ø21.3	179	160	350	61 pc Ø12x1mm
TLC-.5-133-080-21	W-038249	DN80	Ø133	Ø21.3	179	160	372	61 pc Ø12x1mm
TLC-.5-133-076-21	W-038250	Ø76.1	Ø133	Ø21.3	179	160	396	61 pc Ø12x1mm
TLC-.5-133-065-21	W-038251	DN65	Ø133	Ø21.3	179	160	400	61 pc Ø12x1mm
TLC-.5-133-063-21	W-038252	Ø63.5	Ø133	Ø21.3	179	160	418	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-.5-133-100-26	W-038253	DN100	Ø133	DN25	186	160	354	61 pc Ø12x1mm
TLC-.5-133-101-26	W-038254	Ø101.6	Ø133	DN25	186	160	350	61 pc Ø12x1mm
TLC-.5-133-080-26	W-038255	DN80	Ø133	DN25	186	160	372	61 pc Ø12x1mm
TLC-.5-133-076-26	W-038256	Ø76.1	Ø133	DN25	186	160	396	61 pc Ø12x1mm
TLC-.5-133-065-26	W-038257	DN65	Ø133	DN25	186	160	400	61 pc Ø12x1mm
TLC-.5-133-063-26	W-038258	Ø63.5	Ø133	DN25	186	160	418	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-.5-133-100-20	W-038259	DN100	Ø133	DN20	179	160	354	61 pc Ø12x1mm
TLC-.5-133-101-20	W-038260	Ø101.6	Ø133	DN20	179	160	350	61 pc Ø12x1mm
TLC-.5-133-080-20	W-038261	DN80	Ø133	DN20	179	160	372	61 pc Ø12x1mm
TLC-.5-133-076-20	W-038262	Ø76.1	Ø133	DN20	179	160	396	61 pc Ø12x1mm
TLC-.5-133-065-20	W-038263	DN65	Ø133	DN20	179	160	400	61 pc Ø12x1mm
TLC-.5-133-063-20	W-038264	Ø63.5	Ø133	DN20	179	160	418	61 pc Ø12x1mm



TLC-01-133-60		60 barg / 85°C		16 bar[g] / 95°C		Maximum pressure / temperature		
		Volume 4.5 liters		Volume 2.5 liters		316L Concentric		Dry weight 14 kg
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-01-133-100-25	W-038265	DN100	Ø133	Ø25	186	408	604	61 pc Ø12x1mm
TLC-01-133-101-25	W-038266	Ø101.6	Ø133	Ø25	186	408	600	61 pc Ø12x1mm
TLC-01-133-080-25	W-038267	DN80	Ø133	Ø25	186	408	622	61 pc Ø12x1mm
TLC-01-133-076-25	W-038268	Ø76.1	Ø133	Ø25	186	408	646	61 pc Ø12x1mm
TLC-01-133-065-25	W-038269	DN65	Ø133	Ø25	186	408	650	61 pc Ø12x1mm
TLC-01-133-063-25	W-038270	Ø63.5	Ø133	Ø25	186	408	668	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-01-133-100-21	W-038271	DN100	Ø133	Ø21.3	179	408	604	61 pc Ø12x1mm
TLC-01-133-101-21	W-038272	Ø101.6	Ø133	Ø21.3	179	408	600	61 pc Ø12x1mm
TLC-01-133-080-21	W-038273	DN80	Ø133	Ø21.3	179	408	622	61 pc Ø12x1mm
TLC-01-133-076-21	W-038274	Ø76.1	Ø133	Ø21.3	179	408	646	61 pc Ø12x1mm
TLC-01-133-065-21	W-038275	DN65	Ø133	Ø21.3	179	408	650	61 pc Ø12x1mm
TLC-01-133-063-21	W-038276	Ø63.5	Ø133	Ø21.3	179	408	668	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-01-133-100-26	W-038277	DN100	Ø133	DN25	186	408	604	61 pc Ø12x1mm
TLC-01-133-101-26	W-038278	Ø101.6	Ø133	DN25	186	408	600	61 pc Ø12x1mm
TLC-01-133-080-26	W-038279	DN80	Ø133	DN25	186	408	622	61 pc Ø12x1mm
TLC-01-133-076-26	W-038280	Ø76.1	Ø133	DN25	186	408	646	61 pc Ø12x1mm
TLC-01-133-065-26	W-038281	DN65	Ø133	DN25	186	408	650	61 pc Ø12x1mm
TLC-01-133-063-26	W-038282	Ø63.5	Ø133	DN25	186	408	668	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-01-133-100-20	W-038283	DN100	Ø133	DN20	179	408	604	61 pc Ø12x1mm
TLC-01-133-101-20	W-038284	Ø101.6	Ø133	DN20	179	408	600	61 pc Ø12x1mm
TLC-01-133-080-20	W-038285	DN80	Ø133	DN20	179	408	622	61 pc Ø12x1mm
TLC-01-133-076-20	W-038286	Ø76.1	Ø133	DN20	179	408	646	61 pc Ø12x1mm
TLC-01-133-065-20	W-038287	DN65	Ø133	DN20	179	408	650	61 pc Ø12x1mm
TLC-01-133-063-20	W-038288	Ø63.5	Ø133	DN20	179	408	668	61 pc Ø12x1mm



TLC-02-133-60		60 barg / 85°C		16 bar[g] / 95°C		Maximum pressure / temperature		
		Volume 6.5 liters		Volume 5 liters		316L Concentric	Dry weight 26 kg	
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-02-133-100-51	W-038289	DN100	Ø133	Ø51	186	886	1084	61 pc Ø12x1mm
TLC-02-133-101-51	W-038290	Ø101.6	Ø133	Ø51	186	886	1080	61 pc Ø12x1mm
TLC-02-133-080-51	W-038291	DN80	Ø133	Ø51	186	886	1102	61 pc Ø12x1mm
TLC-02-133-076-51	W-038292	Ø76.1	Ø133	Ø51	186	886	1126	61 pc Ø12x1mm
TLC-02-133-065-51	W-038293	DN65	Ø133	Ø51	186	886	1130	61 pc Ø12x1mm
TLC-02-133-063-51	W-038294	Ø63.5	Ø133	Ø51	186	886	1145	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-02-133-100-38	W-038295	DN100	Ø133	Ø38	186	886	1084	61 pc Ø12x1mm
TLC-02-133-101-38	W-038296	Ø101.6	Ø133	Ø38	186	886	1080	61 pc Ø12x1mm
TLC-02-133-080-38	W-038297	DN80	Ø133	Ø38	186	886	1102	61 pc Ø12x1mm
TLC-02-133-076-38	W-038298	Ø76.1	Ø133	Ø38	186	886	1126	61 pc Ø12x1mm
TLC-02-133-065-38	W-038299	DN65	Ø133	Ø38	186	886	1130	61 pc Ø12x1mm
TLC-02-133-063-38	W-038300	Ø63.5	Ø133	Ø38	186	886	1145	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-02-133-100-50	W-038301	DN100	Ø133	DN50	186	886	1084	61 pc Ø12x1mm
TLC-02-133-101-50	W-038302	Ø101.6	Ø133	DN50	186	886	1080	61 pc Ø12x1mm
TLC-02-133-080-50	W-038303	DN80	Ø133	DN50	186	886	1102	61 pc Ø12x1mm
TLC-02-133-076-50	W-038304	Ø76.1	Ø133	DN50	186	886	1126	61 pc Ø12x1mm
TLC-02-133-065-50	W-038305	DN65	Ø133	DN50	186	886	1130	61 pc Ø12x1mm
TLC-02-133-063-50	W-038306	Ø63.5	Ø133	DN50	186	886	1145	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-02-133-100-40	W-038307	DN100	Ø133	DN40	186	886	1084	61 pc Ø12x1mm
TLC-02-133-101-40	W-038308	Ø101.6	Ø133	DN40	186	886	1080	61 pc Ø12x1mm
TLC-02-133-080-40	W-038309	DN80	Ø133	DN40	186	886	1102	61 pc Ø12x1mm
TLC-02-133-076-40	W-038310	Ø76.1	Ø133	DN40	186	886	1126	61 pc Ø12x1mm
TLC-02-133-065-40	W-038311	DN65	Ø133	DN40	186	886	1130	61 pc Ø12x1mm
TLC-02-133-063-40	W-038312	Ø63.5	Ø133	DN40	186	886	1145	61 pc Ø12x1mm



TLC-03-133-60		60 barg / 85°C		16 bar[g] / 95°C		Maximum pressure / temperature		
		Volume 9 liters		Volume 7.5 liters		316L Concentric	Dry weight 37 kg	
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-03-133-100-63	W-038313	DN100	Ø133	Ø63.5	186	1360	1584	61 pc Ø12x1mm
TLC-03-133-101-63	W-038314	Ø101.6	Ø133	Ø63.5	186	1360	1580	61 pc Ø12x1mm
TLC-03-133-080-63	W-038315	DN80	Ø133	Ø63.5	186	1360	1602	61 pc Ø12x1mm
TLC-03-133-076-63	W-038316	Ø76.1	Ø133	Ø63.5	186	1360	1626	61 pc Ø12x1mm
TLC-03-133-065-63	W-038317	DN65	Ø133	Ø63.5	186	1360	1630	61 pc Ø12x1mm
TLC-03-133-063-63	W-038318	Ø63.5	Ø133	Ø63.5	186	1360	1648	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-03-133-100-51	W-038319	DN100	Ø133	Ø51	186	1360	1584	61 pc Ø12x1mm
TLC-03-133-101-51	W-038320	Ø101.6	Ø133	Ø51	186	1360	1580	61 pc Ø12x1mm
TLC-03-133-080-51	W-038321	DN80	Ø133	Ø51	186	1360	1602	61 pc Ø12x1mm
TLC-03-133-076-51	W-038322	Ø76.1	Ø133	Ø51	186	1360	1626	61 pc Ø12x1mm
TLC-03-133-065-51	W-038323	DN65	Ø133	Ø51	186	1360	1630	61 pc Ø12x1mm
TLC-03-133-063-51	W-038324	Ø63.5	Ø133	Ø51	186	1360	1648	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-03-133-100-38	W-038325	DN100	Ø133	Ø38	186	1360	1584	61 pc Ø12x1mm
TLC-03-133-101-38	W-038326	Ø101.6	Ø133	Ø38	186	1360	1580	61 pc Ø12x1mm
TLC-03-133-080-38	W-038327	DN80	Ø133	Ø38	186	1360	1602	61 pc Ø12x1mm
TLC-03-133-076-38	W-038328	Ø76.1	Ø133	Ø38	186	1360	1626	61 pc Ø12x1mm
TLC-03-133-065-38	W-038329	DN65	Ø133	Ø38	186	1360	1630	61 pc Ø12x1mm
TLC-03-133-063-38	W-038330	Ø63.5	Ø133	Ø38	186	1360	1648	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-03-133-100-65	W-038331	DN100	Ø133	DN65	199	1360	1584	61 pc Ø12x1mm
TLC-03-133-101-65	W-038332	Ø101.6	Ø133	DN65	199	1360	1580	61 pc Ø12x1mm
TLC-03-133-080-65	W-038333	DN80	Ø133	DN65	199	1360	1602	61 pc Ø12x1mm
TLC-03-133-076-65	W-038334	Ø76.1	Ø133	DN65	199	1360	1626	61 pc Ø12x1mm
TLC-03-133-065-65	W-038335	DN65	Ø133	DN65	199	1360	1630	61 pc Ø12x1mm
TLC-03-133-063-65	W-038336	Ø63.5	Ø133	DN65	199	1360	1648	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-03-133-100-50	W-038337	DN100	Ø133	DN50	186	1360	1584	61 pc Ø12x1mm
TLC-03-133-101-50	W-038338	Ø101.6	Ø133	DN50	186	1360	1580	61 pc Ø12x1mm
TLC-03-133-080-50	W-038339	DN80	Ø133	DN50	186	1360	1602	61 pc Ø12x1mm
TLC-03-133-076-50	W-038340	Ø76.1	Ø133	DN50	186	1360	1626	61 pc Ø12x1mm
TLC-03-133-065-50	W-038341	DN65	Ø133	DN50	186	1360	1630	61 pc Ø12x1mm
TLC-03-133-063-50	W-038342	Ø63.5	Ø133	DN50	186	1360	1648	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
TLC-03-133-100-50	W-038343	DN100	Ø133	DN40	186	1360	1584	61 pc Ø12x1mm
TLC-03-133-101-50	W-038344	Ø101.6	Ø133	DN40	186	1360	1580	61 pc Ø12x1mm
TLC-03-133-080-50	W-038345	DN80	Ø133	DN40	186	1360	1602	61 pc Ø12x1mm
TLC-03-133-076-50	W-038346	Ø76.1	Ø133	DN40	186	1360	1626	61 pc Ø12x1mm
TLC-03-133-065-50	W-038347	DN65	Ø133	DN40	186	1360	1630	61 pc Ø12x1mm
TLC-03-133-063-50	W-038348	Ø63.5	Ø133	DN40	186	1360	1648	61 pc Ø12x1mm